

Wake Properties of a Stripline Beam Kicker

B. R. POOLE, G. J. CAPORASO, and W. C. NG

*Lawrence Livermore National Laboratory
Livermore, CA. 94550*

The transport of a high current relativistic electron beam in a stripline beam kicker is strongly dependent on the wake properties of the structure. The effect of beam induced fields on the steering of the beam must be determined for a prescribed trajectory within the structure. A 3-D time domain electromagnetic code is used to determine the wake fields and the resultant Lorentz force on the beam both for an ultra-relativistic electron beam moving parallel to the beamline axis as well as a beam that follows a curved trajectory through the structure. Usually in determining the wake properties of the structure, a wake impedance is found for a beam that is moving parallel to the beamline axis. However, we extend this concept to curved trajectories by calculating beam induced forces along the curved trajectory. Comparisons are made with simple transmission line models of the structure. The wake properties are used in models to transport the beam self-consistently through the structure.

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